WHAT IS CLAIMED IS:

1. A lens actuator for use with an optical recording and reproducing apparatus in accordance with a plurality of different multiplied response numeric values to record or reproduce to or from an optical recording medium, said lens actuator for actuating an objective lens to control focusing and tracking, said lens actuator comprising:

a fixed magnetic circuit including a magnet as a magnetic flux generating source and a back yoke;

a support structure that is elastically displaceable depending on a thrust generated amount; and

a movable part including a holder fixing the objective lens and a solenoid coil capable of generating a focusing thrust and a tracking thrust in accordance with current values, respectively,

whereby a resonance frequency around a tangential axis is set to be different from spindle rotation frequencies corresponding to the plurality of multiplied response numeric values.

2. The lens actuator as claimed in claim 1, wherein said resonance frequency around the tangential axis is set to be higher than the spindle rotation frequencies at a reproducing maximum speed and a recoding maximum speed corresponding to the plurality of different multiplied response numeric values, respectively.

3. The lens actuator as claimed in claim 1, wherein said resonance frequency around the tangential axis is set to be lower than the spindle rotation frequencies at a reproducing maximum speed and a recording maximum speed corresponding to the plurality of different multiplied response numeric values, respectively, and is set to be higher than the spindle rotation frequency at a standard speed.

4. The lens actuator as claimed in claim 1, wherein said resonance frequency around the tangential axis is set to be in a not-used rotation frequency band between the spindle rotation frequencies at a reproducing maximum speed and a reading maximum speed corresponding to the plurality of different multiplied response numeric values, respectively.

5. A lens actuator for use with an optical recording and reproducing apparatus, said lens actuator comprising:

a holder holding an objective lens;

a fixed magnetic circuit provided on a base member;

a movable part including said holder and a solenoid coil capable of generating a focusing thrust and a tracking thrust in accordance with current values, respectively, with the fixed magnetic circuit; and

an elastic support member coupling said movable part to a fixing block member while displacing depending on a thrust generation amount;

wherein a damper for resonance attenuation is provided to said elastic support member and the damper, which has characteristics of obtaining a maximum attenuation or a maximum loss in a vicinity of a resonance frequency around a tangential axis, is used.

6. A lens actuator for use with an optical recording and reproducing apparatus, said lens actuator comprising:

a holder holding an objective lens;

a fixed magnetic circuit provided on a base member;

a movable part including said holder and a solenoid coil capable of generating a focusing thrust and a tracking thrust in accordance with current values, respectively, with the fixed magnetic circuit; and

an elastic support member coupling said movable part to a fixing block member while displacing depending on a thrust generation amount;

wherein a damper for resonance attenuation is provided to said the elastic support member and the damper, which has characteristics of obtaining a maximum

attenuation or a maximum loss in a vicinity of a usable maximum rotation frequency of the optical recording and reproducing apparatus, is used.

7. A lens actuator for use with an optical recording and reproducing apparatus, said lens actuator comprising:

a holder holding an objective lens;

a fixed magnetic circuit provided on a base member;

a movable part including said holder and a solenoid coil capable of generating a focusing thrust and a tracking thrust in accordance with current values, respectively, with the fixed magnetic circuit; and

an elastic support member coupling said movable part to a fixing block member while displacing depending on a thrust generation amount;

wherein a damper for resonance attenuation is provided to said elastic support member and the damper, which has characteristics of obtaining a maximum attenuation or a maximum loss from a vicinity of a usable maximum rotation frequency of the optical

recording and reproducing apparatus to a vicinity of a resonance frequency of around a tangential axis, is used.

8. The lens actuator as claimed in claim 5, wherein said damper, which has characteristics of obtaining the maximum attenuation or the maximum loss in a 100 through 200 Hz band, is used.

9. The lens actuator as claimed in claim 5, wherein said damper is made from materials including a polymeric composite or a polymeric material as a main material.

10. The lens actuator as claimed in claim 5, wherein said damper is made from a rubber composite or a rubber material as a main material.

11. The lens actuator as claimed in claim 5, wherein said damper is made from a silicone composite or a silicone material as a main material.